REMARKS

Reconsideration is respectfully requested.

Claims 1-30 were rejected under 35 U.S.C. 101 and 35 U.S.C. 112, first paragraph based on the inclusion of the terms "optimized" and "optimizing" in independent claims 1, 11 and 21.

By the present amendment, the specification has been amended on page 13, line 11 to clarify that the given voltage data is for a lithium-ion cell as discussed in prior portions of the same paragraph. Independent claims 1, 11 and 21 have been amended by reciting that the secondary battery is charged by way of the primary battery while limiting charge/discharge excursions of the secondary battery "to control discharge capacity fade and internal resistance increase during service of said secondary battery." Support for this limitation is found in the Specification at page 13, lines 1-17. Claims 3, 13 and 23 have been amended to conform to the independent claims from which they respectively depend. In claim 23, a missing period "." was added to the end of the claim. Claim 24 was also amended to change "comprising" to the grammatically correct "comprises."

The amendment to claims 1, 11 and 21 should be sufficient to overcome the rejections based on 35 U.S.C. 101 and 112, first paragraph. The objected to "optimizing" language has been removed from independent claims 1, 11 and 21 and respectively replaced with the limitations of dependent claims 3, 13 and 23 specifying that the charge/discharge excursions are selected to control discharge capacity fade and internal resistance increase during service of the secondary battery. The excursion range for a given battery chemistry can be ascertained by experiment. For a lithium-ion secondary battery of conventional design, a voltage range of 3.9-3.7 volts provides the desired minimum level of capacity fade and internal resistance increase over time, as discussed in the Specification at page 13, lines 11-14.

The Office also argues that shrinking the voltage range increases the number of charge/discharge cycles, and therefore increases capacity fade and internal resistance increase, as per the graphs of Figs. 3A and 3B. However, claims 1, 11 and 21 refer to minimizing discharge capacity fade and internal resistance increase "during service of said secondary battery." This means that at any given point during service life following initial placement into service, discharge capacity and internal resistance increase will be minimized. Regarding overall service life, although the total number of charge/discharge cycles may increase, more of these charge/discharge cycles are useable because there is less capacity fade and internal resistance after any given number of cycles. The overall service life of the secondary battery will thus increase as compared to the conventional case where the charge/discharge voltage thresholds of the secondary battery are maximized.

Furthermore, limitation of the upper state of charge will significantly reduce the time dependent degradation of the battery system during quiescent conditions that are tantamount to storage. These conditions would occur in a defibrillator device where high energy shocks are never required for the patient or required on an infrequent basis. It is well known to those skilled in the art that the recoverable capacity loss of lithium ion cells is strongly related to the state of charge at which they are stored. By limiting the upper end of the secondary battery voltage range to less than 100% state of charge, the time dependent loss of recoverable battery capacity will be reduced below that which would be incurred if the battery were fully charged on each charge/discharge cycle.

In view of the foregoing, Applicants respectfully request that all rejections be withdrawn and that Notices of Allowability and Allowance be duly issued.

Respectfully submitted,

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